Environmental Impact Assessment Report (EIAR) – Volume 2

Chapter 16 – Material Assets – Traffic and Transport

CHAPTER 16

Proposed ORE Capable Terminal on a 250m Wharf Extension & Ancillary Operational Support Infrastructure

Port of Waterford Company

Port of Waterford, Belview, Co. Kilkenny

MALONE O'REGAN ENVIRONMENTAL

FIGURES

TABLES

APPENDICES

All appendices referenced in this document are presented in EIAR Volume III

APPENDICES CHAPTER 16

16 MATERIAL ASSETS – TRAFFIC AND TRANSPORT

16.1 Introduction

This chapter of the EIAR presents the findings of the transport assessment carried out for the Proposed Development on a 250m extension to the existing wharves at the Port of Waterford. The existing transport features and surrounding road network are described, the likely effects on the road network are assessed, and mitigation measures are proposed where required.

16.2 Methodology

This chapter describes the assessment methodology to assess the potential effects the Proposed Development may have on the surrounding road network. The assessment describes the existing situation at the Site in terms of access while also describing the existing situation and the predicted future situation on the external road network. The methodology adopted for this assessment is summarised as follows:

- Traffic counts were undertaken in May and September 2023 during a 12-hour period (07:00 – 19:00). Count information was obtained at the existing N29 Slieverue roundabout, the existing N29 / L7582 Industrial Access Road priority junction and the existing N29 / L3412 / L7482 crossroads junction;
- Existing Traffic Assessment – A spreadsheet model was created, which contains the base year DO-NOTHING traffic count data described above. The traffic count data was used to develop a Priority Intersection Capacity and Delay ('PICADY') model of the existing N29 / L7582 Industrial Access Road priority junction and the existing N29 / L3412 / L7482 crossroads junction and an Assessment of Roundabout Capacity and Delay ('ARCADY') model of the existing N29 Slieverue roundabout; and,
- Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and development-related traffic, was used to assess the future operational performance of the junctions at the year of opening of the Proposed Development, 5 years after opening and 15 years after opening.

16.3 Receiving Environment

The existing road network within the vicinity of the application site is illustrated in Figure 16-1 below and is described further below.

16.3.1 Existing Road Network

The access to the Proposed Development will be via the existing L7582 industrial access road, which provides vehicular access from the Proposed Development to the existing N29 national road.

The existing L7582 industrial access road has the following characteristics:

- It is a single-carriageway road that is approximately 7m wide;
- It has a footpath on the eastern side of the carriageway; and,
- Lighting columns are provided on the eastern side of the carriageway.

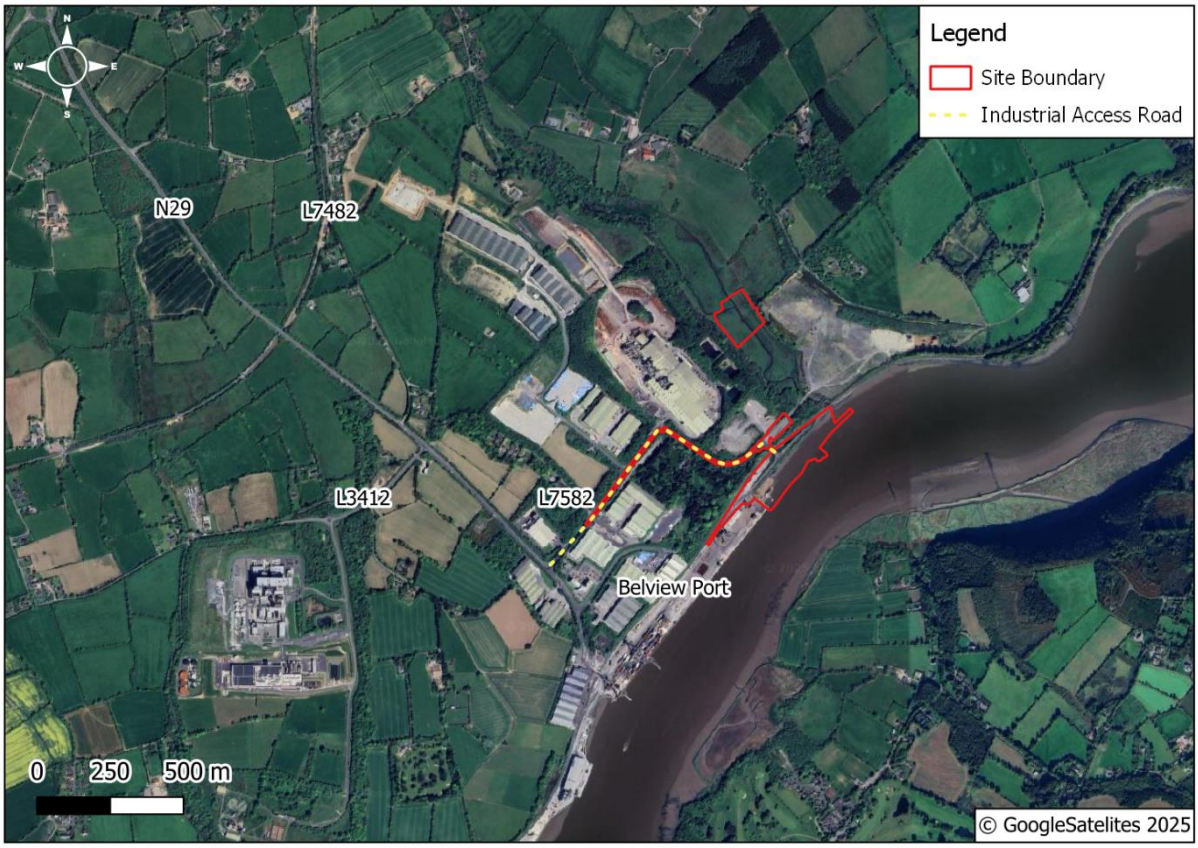
The existing N29 national road has the following characteristics:

- It is a single carriageway road that is approximately 7.5m wide with a 2m wide hard shoulder on either side;
- A 3.5m wide ghost island is provided at the N29 / Industrial Access Road priority junction; and,

- The N29 national road is approximately 4km in length and provides vehicular access from the N25 national road to Belview Port.

The L7582 industrial access road is governed by a 60km/h speed limit and the N29 is governed by a 100km/h speed limit.

Figure 16-1: Local Roads Network



16.3.2 Existing Traffic Volumes

A traffic count was undertaken by Irish Traffic Surveys on the 23rd of May 2023 and the 05th of September 2023 during a 12-hour period (07:00 to 19:00). The count data is provided in Appendix 16-1 – Traffic Counts. Count information was obtained at the following junctions:

- The existing N29 / L7582 Industrial Access Road priority junction;
- The existing N29 / L3412 / L7482 crossroads junction; and,
- The existing N29 Slieverue roundabout.

The traffic flows during the AM and PM peak hours were abstracted from the surveyed data and are shown in Table 16-1 to 16-6 below.

Table 16-1: N29 / L7582 Industrial Access Rd Priority Junction – 2023 AM Peak Flows

From/To	N29 (North)	Industrial Access Rd	N29 (south)	TOTALS
N29 (North)	0	135	81	**216**
Industrial Access Road	51	0	10	**61**
N29 (South)	20	10	0	**30**

From/To	N29 (North)	Industrial Access Rd	N29 (south)	TOTALS
TOTALS	**71**	**145**	**91**	**307**

Table 16-2: N29 / L7582 Industrial Access Rd Priority Junction – 2023 PM Peak Flows

From/To	N29 (North)	Industrial Access Rd	N29 (south)	TOTALS
N29 (North)	0	23	29	**52**
Industrial Access Road	111	0	9	**120**
N29 (South)	122	9	0	**131**
TOTALS	**233**	**32**	**38**	**303**

Table 16-3: N29 / L3412 / L7482 Crossroads – 2023 AM Peak Flows

From/To	N29 (South)	L3412	N29 (North)	L7482	TOTALS
N29 (South)	0	2	198	192	**392**
L3412	4	0	3	4	**11**
N29 (North)	81	0	0	2	**83**
L7482	45	1	12	0	**58**
TOTALS	**130**	**3**	**213**	**198**	**544**

Table 16-4: N29 / L3412 / L7482 Crossroads – 2023 PM Peak Flows

From/To	N29 (South)	L3412	N29 (North)	L7482	TOTALS
N29 (South)	0	1	50	38	**89**
L3412	5	0	0	2	**7**
N29 (North)	208	0	0	19	**227**
L7482	123	12	4	0	**139**
TOTALS	**336**	**13**	**54**	**59**	**462**

Table 16-5: N29 Slieverue Roundabout – 2023 AM Peak Flows

From/To	N29 (North)	N29 (South)	R711	L3411	TOTALS
N29 (North)	22	398	349	16	**785**
N29 (South)	99	0	50	2	**151**
R711	254	97	2	3	**356**
L3411	31	10	14	0	**55**
TOTALS	**406**	**505**	**415**	**21**	**1347**

Table 16-6: N29 Slieverue Roundabout – 2023 PM Peak Flows

From/To	N29 (North)	N29 (South)	R711	L3411	TOTALS
N29 (North)	24	60	297	35	**416**
N29 (South)	215	0	81	21	**317**
R711	401	34	0	21	**456**
L3411	14	16	12	0	**42**
TOTALS	**654**	**110**	**390**	**77**	**1231**

16.3.3 Background Traffic

TII issues a range of traffic growth factors to be applied to existing traffic flows, which are broken down into three groups: low growth, medium growth and high growth. Due to the nature and location of the Proposed Development, it was assumed that high growth was most applicable for the road network surrounding the Proposed Development.

The zone in which the Site is located is numbered 650 in the TII National Traffic Model. The high growth factors for each operational phase are as follows:

Table 16-7: Future Traffic Growth

Zone	2023 Existing	2027 Development Operational	2029 Development Operational	2034 Development Operational	2044 Development Operational
650	1.00	+ 7.71%	+ 11.81%	+22.79	+ 28.65%

These percentages have been used to predict the increase in background traffic along the road network surrounding the Proposed Development that will occur in future years. Full summary tables and predicted future traffic flows for 2029, 2034 and 2044 are included in Appendix 16-2 – Traffic Flow Sheets

16.4 Characteristics & Potential Effects of the Proposed Development

16.4.1 Proposed Access Arrangements

Access to the Site will be via the existing L7852 Industrial Access Road as indicated on the site layout drawing provided in Appendix 3-1 - Drawings. A speed limit of 30km/h applies along the existing L7852 Industrial Access Road.

16.4.2 Potential Effects

The Proposed Development will result in the generation of additional traffic arriving to and from the port. The following information relating to inbound and outbound traffic has been supplied by the Applicant to Roadplan Consulting.

<u>ORE Capable Terminal:</u>

At peak capacity, it is proposed that the ORE Capable Terminals will operate:

- Operator 1, a Crew Transfer Vessel, 35 personnel working at the facility, including landside personnel and personnel going to/from sea daily; and,
- Operator 2, a Crew Transfer Vessel, 35 personnel working at the facility, including landside personnel and personnel going to/from sea daily.

Therefore, based on the above, if all personnel arrived on a specific day, the total number of personnel arriving to the ORE Capable Terminal would be 70.

Personnel associated with the ORE Capable Terminal arriving to the port will most likely arrive by car. It is assumed that car sharing will occur with an occupancy rate of 1.5 persons per car.

Based on the above, the total number of vehicles that will be generated by the ORE Capable Terminal during the AM and PM peak periods is shown in Table 16-8 below.

Table 16-8: ORE Development Traffic Flows

To / From	Trips to Port	Trips from Port
AM Peak	47	0
PM Peak	0	23

In addition to the above, the 250m extension to the existing wharves at the Port of Waterford will result in the generation of additional HGV traffic arriving and departing the Port.

The Applicant has provided Roadplan Consulting with traffic movements associated with the extension to the existing wharves. It is estimated that the extension to the wharves will result in an additional 145 HGV's arriving to the Port of Waterford on a peak day when the unloading of a large bulk carrier will be taking place. A peak day was considered in order to assess a worst-case scenario.

The Port of Waterford operates 24-hours per day, and it was predicted that 6 HGVs will arrive / depart the port during the AM and PM peak periods.

The extension to the Port will also result in an additional 30 staff. It was predicted that staff will arrive in single-car occupancy, resulting in an additional 30 car trips to and from the Port during the AM and PM peak periods.

Therefore, based on the above, the total number of additional HGVs and car trips that will be generated by the extension to the Port during the AM and PM peak periods is shown in the table below.

Table 16-9: Port Extension Development Traffic Flows

To/From	Trips to Port	Trips from Port
AM Peak	36	6
PM Peak	6	36

The access to the Proposed Development will be via the L7582 industrial access road and all personnel working on the Proposed Development will arrive via the L7582 industrial access road. All additional HGV traffic generated by the extension to the existing wharves will arrive via the main entrance to the Port of Waterford.

The National Transport Authority, along with Waterford City and County Council and Kilkenny County Council, have launched a new bus network plan for Waterford. A new bus route from Belview Port to Waterford City has been included. The bus will operate during weekday peak times. It would be reasonable to assume that this new bus route will be utilised by workers in the Port thereby reducing car trips, albeit for the purpose of this assessment a worst-case scenario has been taken and therefore we have not taken into account this new bus route.

16.4.3 Junction Capacity Assessment

A capacity assessment using the computer programme PICADY for the priority junction and ARCADY for the roundabout was carried out for the following junctions:

- the existing N29 / L7582 Industrial Access Road priority junction;
- the existing N29 / L3412 / L7482 crossroads junction; and,
- the existing N29 Slieverue roundabout.

Full details and results of capacity assessments are contained in Appendix 16-4 – PICADY Results and Appendix 16-5 – ARCADY Results. The parameters shown in the tables are defined as follows:

- **Ratio of Flow to Capacity ('RFC')** is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity;
- **Avg. Queue** is the average number of vehicles queued over the time period on the junction approach;
- **Queue delay** is the average number of seconds delay to each vehicle in the time period; and,
- **Total Delay** is the total number of vehicle hours of delay to all vehicles at the junction over the time period, which is included in Appendix 16-3 PICADY and Appendix 16-4 ARCADY.

16.4.4 N29 / Industrial Access Rd Priority Junction

Table 16-10 below shows the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the N29 / Industrial Access Road priority junction.

Table 16-10: N29 / Industrial Access Rd Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.13	0	9
		N29 (east)	0.02	0	6
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.27	0	11
		N29 (east)	0.02	0	6
2029 - No Development	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.14	0	10
		N29 (east)	0.02	0	6
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.30	0	11
		N29 (east)	0.02	0	6
2029 With Development	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.14	0	10
		N29 (east)	0.02	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.36	1	13
		N29 (east)	0.02	0	6
2034 - No Development	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.16	0	10
		N29 (east)	0.02	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.33	1	12
		N29 (east)	0.02	0	6
		N29 (west)	-	-	-

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2034 With Development	AM Peak	Industrial Access Rd	0.16	0	10
		N29 (east)	0.02	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.39	1	13
		N29 (east)	0.02	0	6
2044 - No Development	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.17	0	10
		N29 (east)	0.03	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.35	1	12
		N29 (east)	0.02	0	6
2044 With Development	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.17	0	10
		N29 (east)	0.03	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.41	1	14
		N29 (east)	0.02	0	6

At present the existing junction operates within capacity with no queues and minimal delays during the AM and PM peak hour.

In 2029, 2034 and 2044 with the ORE Capable Terminal operational and the extension to the wharves in operation, the existing N29 / L7582 Industrial Access Road priority junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

16.4.5 N29 / L3412 / L7482 Crossroads Junction

The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the N29 / L3412 / L7482 crossroads junction – see Table 16-11 below.

Table 16-11: N29 / L3412 / L7482 Crossroads Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (east)	0.43	1	9
		L3412	0.02	0	11
		N29 (west)	0.00	0	6
		L7482	0.12	0	8
	PM Peak	N29 (east)	0.08	0	7
		L3412	0.01	0	9
		N29 (west)	0.02	0	6
		L7482	0.28	0	9
2029 - No Development	AM Peak	N29 (east)	0.49	1	10
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.14	0	8
	PM Peak	N29 (east)	0.09	0	7
		L3412	0.02	0	10
		N29 (west)	0.02	0	6
		L7482	0.31	1	10
2029 With Development	AM Peak	N29 (east)	0.51	1	10
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.14	0	8
	PM Peak	N29 (east)	0.10	0	7
		L3412	0.02	0	10
		N29 (west)	0.02	0	6
		L7482	0.32	1	10
		N29 (east)	0.55	2	11

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2034 - No Development	AM Peak	L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.15	0	8
	PM Peak	N29 (east)	0.11	0	7
		L3412	0.02	0	10
		N29 (west)	0.03	0	6
		L7482	0.35	1	10
2034 With Development	AM Peak	N29 (east)	0.57	2	11
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.16	0	9
	PM Peak	N29 (east)	0.11	0	7
		L3412	0.02	0	10
		N29 (west)	0.03	0	6
		L7482	0.35	1	10
2044 - No Development	AM Peak	N29 (east)	0.59	2	12
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.16	0	9
	PM Peak	N29 (east)	0.11	0	7
		L3412	0.02	0	10
		N29 (west)	0.03	0	6
		L7482	0.37	1	11
2044 With Development	AM Peak	N29 (east)	0.60	2	12
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.17	0	9
	PM Peak	N29 (east)	0.12	0	7
		L3412	0.02	0	10
		N29 (west)	0.03	0	6
		L7482	0.37	1	11

At present the existing N29 / L3412 / L7482 crossroads junction operates within capacity with minimal queues and delays during the AM and PM peak hours.

In 2029, 2034 and 2044 with the Proposed Development operational the existing N29 / L3412 / L7482 crossroads junction will continue to operate within capacity with minimal queues and delays during the AM and PM peak hour.

16.4.6 N29 Slieverue Roundabout

The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the N29 / L3411 / R711 Roundabout.

Table 16-12: N29 / L3411 / R711 Roundabout

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (north)	0.40	1	3
		N29 (south)	0.11	0	3
		R711	0.27	0	3
		L3411	0.07	0	4
	PM Peak	N29 (north)	0.21	0	2
		N29 (south)	0.23	0	3
		R711	0.37	1	4
		L3411	0.06	0	5
2029 - No Development	AM Peak	N29 (north)	0.43	1	3
		N29 (south)	0.12	0	3
		R711	0.29	0	4
		L3411	0.07	0	4
		N29 (north)	0.22	0	2

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
	PM Peak	N29 (south)	0.25	0	3
		R711	0.39	1	4
		L3411	0.06	0	5
2029 With Development	AM Peak	N29 (north)	0.45	1	3
		N29 (south)	0.12	0	3
		R711	0.30	0	4
		L3411	0.07	0	4
	PM Peak	N29 (north)	0.22	0	2
		N29 (south)	0.27	0	3
		R711	0.39	1	4
		L3411	0.06	0	5
2034 - No Development	AM Peak	N29 (north)	0.47	1	3
		N29 (south)	0.13	0	3
		R711	0.32	1	4
		L3411	0.08	0	4
	PM Peak	N29 (north)	0.24	0	2
		N29 (south)	0.27	0	3
		R711	0.43	1	5
		L3411	0.07	0	5
2034 With Development	AM Peak	N29 (north)	0.49	1	3
		N29 (south)	0.14	0	3
		R711	0.33	1	4
		L3411	0.08	0	5
	PM Peak	N29 (north)	0.25	0	2
		N29 (south)	0.29	0	4
		R711	0.44	1	5
		L3411	0.07	0	5
2044 - No Development	AM Peak	N29 (north)	0.51	1	4
		N29 (south)	0.15	0	3
		R711	0.35	1	4
		L3411	0.09	0	5
	PM Peak	N29 (north)	0.27	0	2
		N29 (south)	0.30	0	4
		R711	0.48	1	5
		L3411	0.08	0	5
2044 With Development	AM Peak	N29 (north)	0.54	1	4
		N29 (south)	0.15	0	3
		R711	0.36	1	4
		L3411	0.09	0	5
	PM Peak	N29 (north)	0.27	0	2
		N29 (south)	0.32	1	4
		R711	0.48	1	5
		L3411	0.08	0	5

At present, the existing N29 / Slieverue roundabout operates within capacity with minimal queues and delays during the AM and PM peak hour.

In 2029, 2034 and 2044, with the Proposed Development operational, the existing N29 / Slieverue roundabout will continue to operate within capacity with minimal queues and delays during the AM and PM peak hour.

16.4.7 Construction Traffic Effect

The construction period will be approximately 18 - 24 months. The busiest period of the construction works from a traffic perspective will occur during the reclamation works, when there will be a requirement to import ca. 160,000 tonnes of fill materials over a 5-month period. During the filling phase of the construction works, it was estimated that there will be approximately 87 HGVs per day arriving to the site over a period of 5-mo5 months

Based on a 10-hour operating day, it was estimated that nine HGVs will arrive / depart the construction site during the AM and PM peak periods.

In addition, it was expected that there will be approximately 27 vehicles associated with staff during the reclamation phase of the construction works.

All construction traffic will travel via the N29 / L7582 Industrial Access Road priority junction in order to gain access to the construction site. The construction compound will provide an area within the Site to allow loading and unloading of HGV vehicles if required.

A capacity assessment was carried out during the peak Construction Phase in order to determine the effect the construction of the development will have on the surrounding road network and junction.

Based on the above, the total number of traffic flows that will be generated by the peak Construction Phase during the AM and PM peak periods is shown in Table 16-13 below.

Table 16-13: Peak Construction Traffic Flows

To / From	Trips to Site	Trips from Site
AM Peak	36	9
PM Peak	9	36

The following tables (Table 16-14 to 16-16) show the predicted RFC values, average queue lengths, average vehicle delay and total delays for the following junctions:

- the existing N29 / L7582 Industrial Access Road priority junction;
- the existing N29 / L3412 / L7482 crossroads junction; and,
- the existing N29 Slieverue roundabout.

Table 16-14: N29 / Industrial Access Road Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.13	0	9
		N29 (east)	0.02	0	6
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.27	0	11
		N29 (east)	0.02	0	6
2027 Peak Construction Phase	AM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.16	0	10
		N29 (east)	0.02	0	7
	PM Peak	N29 (west)	-	-	-
		Industrial Access Rd	0.38	1	13
		N29 (east)	0.02	0	6

At present, the existing N29 / L7582 Industrial Access Road priority junction operates within capacity with no queues and minimal delays during the AM and PM peak hour.

In 2027, during the peak Construction Phase, the existing N29 / L7582 Industrial Access Road priority junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

Table 16-15: N29 / L3412 / L7482 Crossroads Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (east)	0.43	1	9
		L3412	0.02	0	11
		N29 (west)	0.00	0	6

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
		L7482	0.12	0	8
	PM Peak	N29 (east)	0.08	0	7
		L3412	0.01	0	9
		N29 (west)	0.02	0	6
		L7482	0.28	0	9
2027 Peak Construction Phase	AM Peak	N29 (east)	0.48	1	10
		L3412	0.02	0	12
		N29 (west)	0.00	0	7
		L7482	0.13	0	8
	PM Peak	N29 (east)	0.09	0	7
		L3412	0.01	0	10
		N29 (west)	0.02	0	6
		L7482	0.30	0	10

At present, the existing N29 / L3412 / L7482 crossroads junction operates within capacity with minimal queues and delays during the AM and PM peak hour.

In 2027, during the peak Construction Phase, the existing N29 / L3412 / L7482 crossroads junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

Table 16-16: N29 Slieverue Roundabout

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2023 Base Year	AM Peak	N29 (north)	0.43	1	9
		N29 (south)	0.02	0	11
		R711	0.00	0	6
		L3411	0.12	0	8
	PM Peak	N29 (north)	0.08	0	7
		N29 (south)	0.01	0	9
		R711	0.02	0	6
		L3411	0.28	0	9
2027 Peak Construction Phase	AM Peak	N29 (north)	0.45	1	3
		N29 (south)	0.13	0	3
		R711	0.30	0	4
		L3411	0.07	0	4
	PM Peak	N29 (north)	0.23	0	2
		N29 (south)	0.28	0	3
		R711	0.41	1	5
		L3411	0.06	0	5

At present, the existing N29 / Slieverue roundabout operates within capacity with minimal queues and delays during the AM and PM peak hour.

In 2027, during the peak Construction Phase, the existing N29 Slieverue roundabout will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

16.5 Proposed Mitigation Measures and/or Factors

It has been demonstrated in this chapter that during the Construction and Operational Phases, the Proposed Development will generate a small increase in HGV movements on the surrounding local network. HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse effects:

- The Port of Waterford will adhere to a routing policy to ensure all movements will be made via the strategic road network to avoid HGV's passing through residential areas as far as is practicable; and,

- The Port of Waterford will employ a policy of safety and environmental awareness for all HGV drivers accessing the site.

16.6 Cumulative and In Combination Effect

Potential cumulative effects associated with the Proposed Development were also assessed.

There will be a small increase in journeys during the Construction and Operational Phases of the Proposed Development. Therefore, a small change in cumulative traffic demand will occur from the Proposed Development in the locality.

16.7 Interactions with other Environmental Attributes

- Chapter 5 (Population and Human Health). Emissions from both road and ship traffic may have a negative effect on human health. Traffic may also be considered a nuisance to the population. This was assessed as part of the air quality assessment (Chapter 9), which concluded that the effect will be not significant;
- Chapter 9 (Air Quality). Air Quality can be adversely affected by particulates and gaseous emissions from traffic. This was assessed in this chapter (section 9.5.1.1 and 9.5.2.1), which concluded that the effect will be not significant;
- Chapter 10 (Climate). Carbon emissions from traffic (both on and off-site) have the potential to increase overall GHG emissions related to the Proposed Development. GHG emissions related to traffic moving to and from the Proposed Development were considered to be not significant in the context of National GHG emissions and imperceptible in the context of the positive indirect effect of the Proposed Development;
- Chapter 11(Terrestrial Noise and Vibration). Traffic adds to the level of noise on-site. Emissions from traffic were considered in the assessment detailed in Chapter 11, which concluded that the effects relating to the Proposed Development will not be significant;
- Chapter 12 (Underwater Noise and Vibration). The effect of the construction activities were also considered on underwater acoustic environment in Chapter 12 and were also considered to be not significant; and,
- Chapter 15 (Material Assets – Natural Resources, Energy and Waste) There will be a temporary increase in traffic on the roads during the Construction Phase. This has been assessed in Chapter 16 as part of the overall traffic assessment, and the effect was deemed to be not significant – see Section 16.9 below.

16.8 Residual Effects

Junction capacity assessment was carried out to determine the operation performance of the existing N29 / L7582 Industrial Access Road priority junction, the existing N29 / L3412 / L7482 crossroads junction and the existing N29 / Slieverue roundabout when the Proposed Development will be operational. The analysis showed the following:

- The existing N29 / L7582 Industrial Access Road priority junction currently operates within capacity with no queues and minimal delays;
- The existing N29 / L7582 Industrial Access Road priority junction will operate within capacity with minimal queues and delays when the Proposed Development will be operational in 2029, year of opening, 2034, five years after completion and in 2044, fifteen years after completion;
- The existing N29 / L3412 / L7482 crossroads junction currently operates within capacity with minimal queues and delays;

- The existing N29 / L3412 / L7482 crossroads junction will operate within capacity with minimal queues and delays when the Proposed Development will be operational in 2029, year of opening, 2034, five years after completion and in 2044, fifteen years after completion;
- The existing N29 / Slieverue roundabout currently operates within capacity with minimal queues and delays; and,
- The existing N29 / Slieverue roundabout will operate within capacity with minimal queues and delays when the Proposed Development will be operational in 2029, year of opening, 2034, five years after completion and in 2044, fifteen years after completion.

Junction capacity assessment was carried out to determine the operation performance of the existing N29 / L7582 Industrial Access Road priority junction, the existing N29 / L3412 / L7482 crossroads junction and the existing N29 / Slieverue roundabout during the peak construction phase of the Proposed Development. The analysis showed the following:

- In 2027, during the peak Construction Phase, the existing N29 / L7582 Industrial Access Road priority junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour;
- In 2027, during the peak Construction Phase, the existing N29 / L3412 / L7482 crossroads junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour; and,
- In 2027, during the peak Construction Phase, the existing N29 Slieverue roundabout will continue to operate within capacity.

16.9 Monitoring

The Port of Waterford will continuously monitor the routing policy to ensure all movements will be made via the strategic road network to ensure that delays and effects at key junctions will be minimised.

16.10 Reinstatement

Not applicable.

16.11 Difficulties Encountered in Compiling this Information

No difficulties were encountered when compiling this information.